

Extruding Press Profiles

(according to DIN EN 12020 part 2)

alloy: Al Mg Si 0.5 F 25
 material-No: 3.3206.72
 condition: hardened off by heat

Mechanical Data

(values in direction of press)

	Standard Profiles	Precision Profiles
tensile strength Rm:	min. 245 ^N / mm ²	min. 350 ^N / mm ²
elastic limit Rp 0.2:	min. 195 ^N / mm ²	min. 290 ^N / mm ²
ductile yield:	min 10 %	min 10 %
modulus of elasticity:	70 kN / mm ²	70 kN / mm ²
Brinell hardness:	HB 75	HB 108
thermal expansion		
20 - 100°C:	23.4 · 10 ⁻⁶ / °C	23.1 · 10 ⁻⁶ / °C
density:	2.7 kg / dm ³	2.77 kg / dm ³

Tolerances

Production related deviations in regards to straightness, flatness and twist but also outside and t-slot dimensions are in accordance with the standard DIN EN 12020: 9001 part 2.

Surface Treatment

anodized to E6 / EV1 (natural) or
 E6 / EV6 (black)
 coating thickness: ca. 15 µm
 coating hardness: 250 - 350 HV
 RAL colors powder coated (on request).

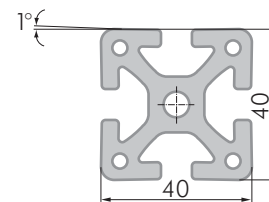
Supplied Lengths

(according to DIN EN 12020 part 2)

Requirements for exact extrusion lengths should be communicated with your order. Standard 3 m or 6 m length extrusions may be slightly longer due to production related requirements.

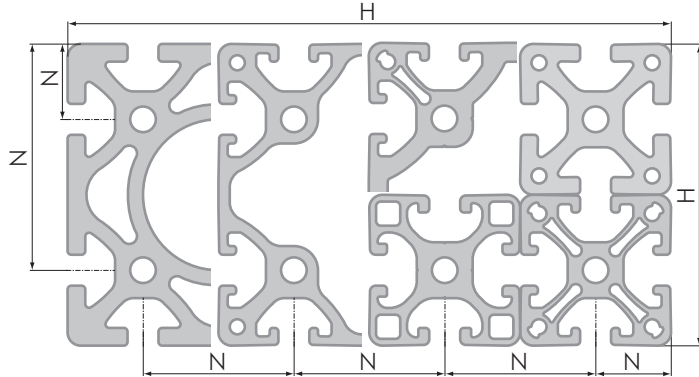
NV Profile T-Slot

The NV t-slot is not pretensioned. The NV profile range has been designed for use with gauge plates and linear bearings, that require the profile surface to be flat. E.g. Jigs, fixtures and special purpose machines.



pretensioned 1° not pretensioned

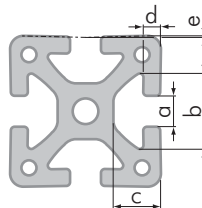
Tolerances Of External Dimensions And T-Slot Positions



width H [mm] above	till	tolerances of external dimension H or rather t-slot position N ± [mm]
0	10	0.10
10	20	0.15
20	40	0.20
40	60	0.30
60	80	0.40
80	100	0.45
100	120	0.50
120	160	0.60
160	240	0.80

T-Slot Dimension Tolerances

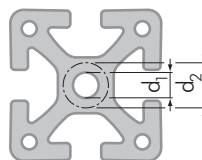
The **standard, double bridge, semi, light** and **superlight** series profiles possess a standardised t-slot shape. This guarantees that all fasteners and accessories can be utilised with the different profile series and sizes.



gauge	20	30	40
a	5.20 ± 0.1	8.20 ± 0.1	8.20 ± 0.1
b	11.50 + 0.3	19.60 ± 0.1	20.00 ± 0.1
c	6.35 ± 0.2	10.10 ± 0.2	12.40 ± 0.2
d	1.80 ± 0.1	2.50 ± 0.1	4.50 ± 0.1
e	0.15 ± 0.1	0.18 ± 0.1	0.20 ± 0.1

Center Holes

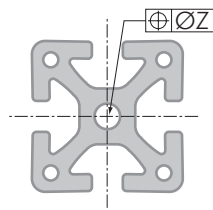
The center hole bore of the profiles can be opened up according to the table. Profiles of the series superlight (40 mm) and midi (30 mm), however, may not be opened up due to the wall section around the center hole.



	20	30	40
drilling d ₁	Ø 4.3-0.2 mm (M5)	Ø 6.8-0.2 mm (M8)	Ø 6.8-0.2 mm (M8)
drillable up to max. d ₂	Ø 6 mm (M6)	-	Ø 13 mm (M12) (not for sl)

Drilling Position Tolerances

The drilling position tolerance is dependent upon the number of the center hole bores and the contour of the profile.



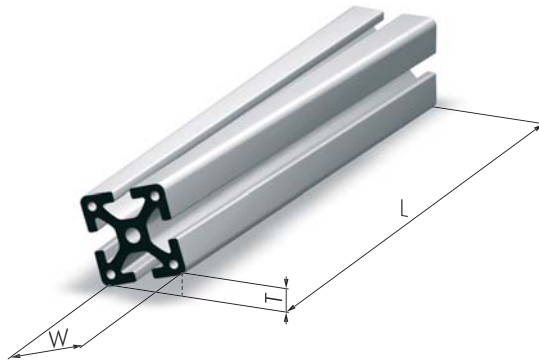
	profiles with open t-slots	profiles with closed t-slots	
number of drillings	Z [mm]	number of drillings	Z [mm]
1	0.4	1	0.6
2 to 4	0.6	> 1	0.8
> 4	0.8		

T-Slot Strength

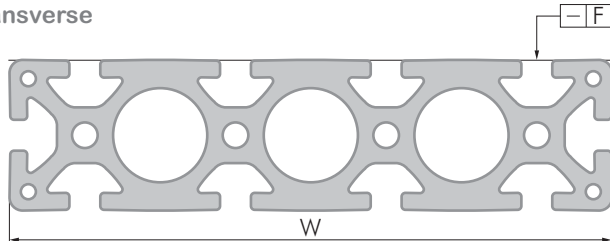
Information in regards to the maximum allowable t-slot load capability F. These values already contain a safety factor (S > 2) against plastic deformation.



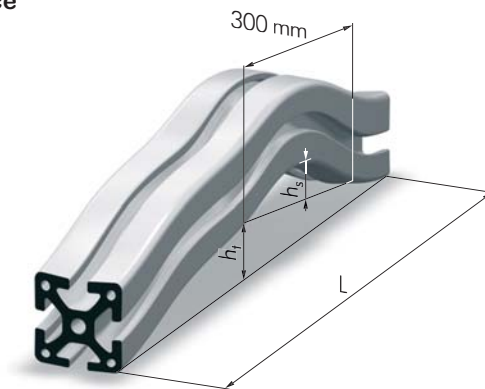
t-slot shape	max. pull charge F	matrix
standard	5000 N	40
double br.	3250 N	40
semi	2500 N	40
light	2000 N	40
superlight	1750 N	40
midi	750 N	30
mini	500 N	20

Torsion


width W [mm] above till		torsion tolerance T [mm] for nominal length L [mm]					
		till 1000	till 2000	till 3000	till 4000	till 5000	till 6000
-	25	1.0	1.5	1.5	2.0	2.0	2.0
25	50	1.0	1.2	1.5	1.8	2.0	2.0
50	75	1.0	1.2	1.2	1.5	2.0	2.0
75	100	1.0	1.2	1.5	2.0	2.2	2.5
100	125	1.0	1.5	1.8	2.2	2.5	3.0
125	150	1.2	1.5	1.8	2.2	2.5	3.0
150	200	1.5	1.8	2.2	2.6	3.0	3.5
200	300	1.8	2.5	3.0	3.5	4.0	4.5

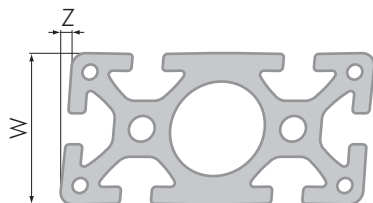
**Straightness Tolerance
transverse**


width W [mm] above till		straightness tolerance F [mm]
0	30	0.20
30	60	0.30
60	100	0.40
100	150	0.50
150	200	0.70
200	250	0.85

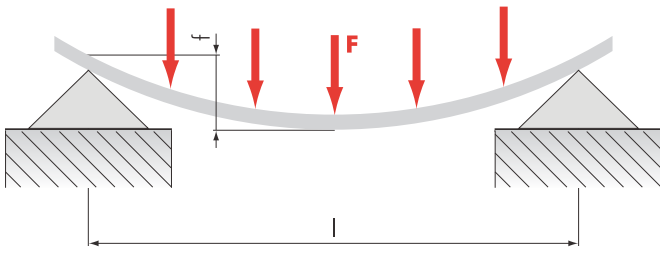
**Straightness Tolerance
longitudinal**


length L [mm]	straightness tolerance h _t for nominal length L [mm]
till 1000	0.7
till 2000	1.3
till 3000	1.8
till 5000	2.2
till 5000	2.6
till 6000	3.0

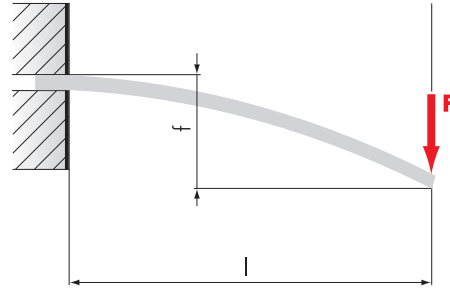
The straightness tolerance h_t is in relation to a corresponding length L and will not exceed the stated value in the table. The straightness tolerance h_s will not exceed 0.3 mm per 300 mm in length.

Angle Tolerance


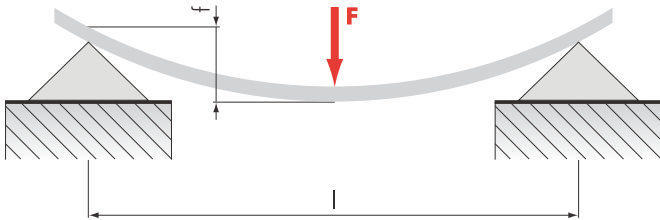
width W [mm] above till		permissible deflection Z [mm] from a right angle
0	20	0.2
20	40	0.4
40	80	0.6
80	120	0.8
120	200	1.2
>200		1.5



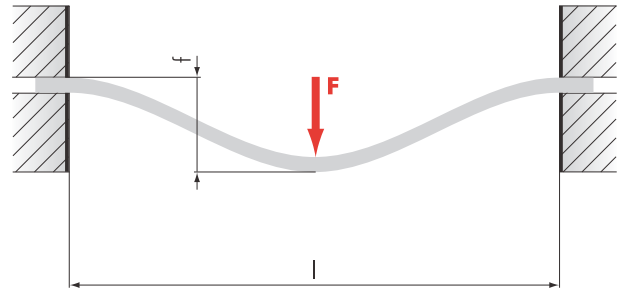
Exposure Case 1 (on two stilts, distributed load)



Exposure Case 2 (fixed one-sided, point load)



Exposure Case 3 (on two stilts, point load)



Exposure Case 4 (fixt two-sided, point load)

To calculate deflection the following calculations are to be used:

Exposure Case 1

$$f = \frac{5 \cdot F \cdot L^3}{384 \cdot E \cdot I \cdot 10^4}$$

Exposure Case 3

$$f = \frac{F \cdot L^3}{48 \cdot E \cdot I \cdot 10^4}$$

Exposure Case 1

$$f = \frac{F \cdot L^3}{3 \cdot E \cdot I \cdot 10^4}$$

Exposure Case 4

$$f = \frac{F \cdot L^3}{192 \cdot E \cdot I \cdot 10^4}$$

To calculate deflection caused by dead weight the following calculations are to be used:

Exposure Case 2

$$f = \frac{F \cdot L^3}{8 \cdot E \cdot I \cdot 10^4}$$

Exposure Case 3

$$f = \frac{5 \cdot F \cdot L^3}{384 \cdot E \cdot I \cdot 10^4}$$

Exposure Case 4

$$f = \frac{F \cdot L^3}{384 \cdot E \cdot I \cdot 10^4}$$

- F load [N]
- L profile length [mm]
- I moment of inertia [cm⁴]
- E modulus of elasticity [N/mm²]
- E_{Al} = 70,000 N/mm²

Control Of The Deflection

$$s = \frac{M_b}{W \cdot 10^3}$$

- s deflection [N/mm²]
- M_b maximum bending [N/mm]
- W resistive moment [cm³]

Example

- known values: Profile 40 x 80 double bridge, upright
- F = 10,000 N
- L = 500 mm
- I = 73.74 cm⁴

to calculate: deflection f

Results

- Exposure Case 1: f = 1.17 mm
- Exposure Case 2: f = 8.07 mm
- Exposure Case 3: f = 0.50 mm
- Exposure Case 4: f = 0.126 mm